CBCS SCHEME

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15EC42

Fourth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Microprocessor

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Draw the register organization of 8086 microprocessor and explain the function of each register. **(08 Marks)**

b. Explain the functions of the following signals of 8086 : i) $M/\overline{IO}$ ii) $DT/\overline{R}$. **(04 Marks)**

c. Suppose (SI) = 1234h, (BX) = 2345h, (DS) = 3456h and (CS) = 4567h, calculate the offset and physical addresses of data in the instruction : MOV AL, [BX][SI]10h. **(04 Marks)**

OR

2 a. Describe any 4 addressing modes of 8086, with one example for each. **(08 Marks)**

b. Explain the following instructions of 8086 with an example : i) XLAT ii) LEA. **(04 Marks)**

c. Give that the opcode of MOV instruction is 100010, determine the machine code of the instruction " MOV[SI], DL. **(04 Marks)**

Module-2

3 a. Write an assembly language program (ALP) using string instructions and assembler directives, to reverse the given array of 100 bytes, and store them in another array. Write comments. **(08 Marks)**

b. Explain the following assembler directives with one example for each : i) ORG ii) EQU. **(04 Marks)**

c. Write an ALP to add two BCD numbers available in memory, and store the sum along with carry in memory. **(04 Marks)**

OR

4 a. An array of unsigned numbers contains 100 byres. Write an ALP to find the largest number among them, and store the result in memory. Use assembler directives, and write comments. **(08 Marks)**

b. List the conditional branch instructions that depend on the status of two flags. Given the conditions under which the branching occurs. **(04 Marks)**

c. What is the difference between SHR and SAR instructions? Illustrate with an example. **(04 Marks)**

Module-3

5 a. Explain the structure and uses of stack. Illustrate the role of stack during the execution of inter-segment CALL and RET instructions, with the help of neat diagrams. **(08 Marks)**

b. What is meant by NMI? Explain the steps taken by the microprocessor serves NMI. **(04 Marks)**

c. Write a Macro to display a message on the computer screen. Call this macro to display two different massages. **(04 Marks)**

OR

6 a. Draw the interrupt vector table of 8086, and describe how the microprocessor gets the adders of interrupt service routine. Demonstrate with the execution of Type–1 interrupt. **(06 Marks)**

b. List the methods of passing the parameters to and from procedures. Briefly explain any one method. **(06 Marks)**

c. Write a program to generate a delay of 50ms using an 8086 system that runs at 10MHz frequency. **(04 Marks)**

Module-4

7 a. With neat timing diagram, discuss the memory write cycle of 8086 microprocessor in maximum mode. **(08 Marks)**

b. Design and draw the interface between 8086 CPU, and two chips of 16KB EPROM and two chips of 32KB RAM. The ending address of EPROM should be FFFFFh, and the starting address of RAM should be 00000h. **(08 Marks)**

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OR

8 a. Draw the block diagram of minimum mode 8086 system, and explain the same. **(08 Marks)**

b. Draw the internal architecture of 8255 PPI, and describe mode 0 and BSR modes. **(08 Marks)**

Module-5

9 a. Interface ADC – 0808 with 8086 μP using the ports of 8255 PPI – show the schematic diagram and write the required ALP. **(08 Marks)**

b. Using DOS function calls, write an ALP to read a hexadecimal digit from key –board, and display its square on the computer screen. Use assembler directives. **(08 Marks)**

OR

10 a. Interface a stepper motor with 8086 μP using the ports of 8255 PPI. Show the schematic diagram and write an ALP to rotate the motor shaft by 360° clockwise. **(08 Marks)**

b. What is the use of 8087 coprocessor? With a neat diagram, explain the interconnection of 8087 with 8086 CPU. **(08 Marks)**

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